

### ABSTRACT OF THE DISCLOSURE

A method for forming a patterned amorphous carbon layer in a semiconductor stack, including forming an amorphous carbon layer on a substrate and forming a silicon containing photoresist layer on top of the amorphous carbon layer. Thereafter, the method includes developing a pattern transferred into the resist layer with a photolithographic process and etching through the amorphous carbon layer in at least one region defined by the pattern in the resist layer, wherein a resist layer hard mask is formed in an outer portion of the photoresist layer during etching.